

REMARKS

Claims 1-7 are pending in the present application. Claims 1-5 have been amended. New claims 6-7 have been added as a result of this response. Applicants respectfully submit that independent claim 1 and dependent claims 2-7 stand in condition for allowance.

I. Allowable Subject Matter

Applicants appreciate the Examiner's indication that claims 4 and 5 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

II. Claim Rejections Under 35 U.S.C. § 102(b)

The Examiner has rejected claims 1-3 under 35 U.S.C. § 102(b) as being anticipated by Mizuno et al. (U.S. Patent 5,103,652) This rejection is respectfully traversed.

The present invention is a refrigeration apparatus "provided with a refrigerant circuit having a plurality of refrigerant circulating routes" as recited in claim 1. The refrigeration apparatus is "capable of operation in a mode where the plurality of refrigerant circulating routes differ in at least one of refrigerant evaporation temperature and refrigerant condensation temperature". Therefore, in the present invention, not only can the paths of each of the refrigerant circulating routes differ from each other, the characteristics of the substance in each of the refrigerant circulating routes can differ in a least one way. In addition, claim 1 provides that the present invention includes a compressor of the refrigerant circuit that "comprises a single casing in which a first compression mechanism linked to a first refrigerant circulating route and a second compression mechanism linked to a second refrigerant circulating route are arranged." Since there is only a single compressor in the refrigerating circuit, space and cost reduction are achieved while still containing the benefits of having a plurality of "refrigerant circulating routes [that] differ in at least one of refrigerant evaporation temperature and refrigerant condensation temperature". In other applications, to maintain a plurality of "refrigerant circulating routes [that] differ in at least one of refrigerant evaporation temperature and refrigerant condensation temperature" the refrigeration apparatus would require a plurality of compressors.

Mizuno teaches a refrigeration apparatus that is a one-stage compressor and describes a method for compressing air. Mizuno uses a scroll compressor that operates as a low-temperature single-stage compressor. The one stage compressor has its advantages over a two-stage compressor at evaporation temperatures of -45° to -70° . A two-stage compressor, compresses air two separate times where as the invention in Minuzo compresses the air only once. In addition, gas injection increases the amount of discharge refrigerant by injecting gas to a once-sealed compression chamber using the differential pressure between refrigerant supply pressure and pressure in the compression chamber in the middle of a compression operation. In a system according to Mizuno, a power loss is inevitable due to expansion of supply refrigerant during gas injection. However, such a power loss does not occur in a two-stage compression system using two compression mechanisms. Further, liquid injection in Mizuno is performed to cool discharge refrigerant and cannot relate to the refrigeration cycle of the present invention having a multiple refrigerant circulating routes.

Mizuno discloses a structure of connecting a liquid injection pipe to the vicinity of the central portion of a scroll and a gas injection pipe to the vicinity of the outer portion of the scroll. Mizuno fails to disclose the feature of the present invention, arranging two compression mechanisms in a single casing and connecting each of the mechanisms to a different refrigerant circulating route. Therefore, the present invention has a different structure from Mizuno. More specifically, Mizuno fails to teach "a refrigeration apparatus provided with a refrigerant circuit having a plurality of refrigerant circulating routes" as recited in claim 1 of the present application. In addition, Mizuno fails to teach a refrigeration apparatus provided with a refrigerant circuit "capable of operation in a mode where the plurality of refrigerant circulating routes differ in at least one of refrigeration evaporation temperature and refrigerant condensation temperature". Also, Mizuno fails to teach an apparatus in which "a compressor of the refrigerant circuit comprises a single casing in which a first compression mechanism linked to a first refrigerant circulating route and a second compression mechanism linked to a second refrigerant circulating route are arranged."

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Independent claim 1 and dependant claims 2-7 which depend from claim 1 stand in condition for allowance. Applicants respectfully request the outstanding rejection under 35 U.S.C. § 102(b) be withdrawn.

III. Conclusion.

All matters having been addressed in view of the foregoing, Applicants respectfully request the entry of this Amendment, the Examiner's reconsideration of this application, and the immediate allowance of all pending claims.

Applicants' undersigned representative remains ready to assist the Examiner in any way to facilitate and expedite the prosecution of this matter. If any point remains an issue in which the Examiner feels would be best resolved through a personal or telephone interview, please contact D. Richard Anderson (Reg. No. 40,439) at the telephone number listed below.

Please charge any fees associated with the submission of this paper to Deposit Account No. 02-2448. The Commissioner for Patents is also authorized to credit any overpayments to the above-referenced deposit account.

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Respectfully submitted,

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